WGSL Final Report for Sedimentation Basin Restoration
Whelan, Joseph
to:
Arlene Kabei, Steve Armann, Rich Vaille, Stephen Tyahla, Bret Moxley, Andrew Helmlinger, Steve Wall, 'stuart.yamada@doh.hawaii.gov', 'Steven.chang@doh.hawaii.gov', 'alec.wong@doh.hawaii.gov'
06/15/2011 04:03 PM
Hide Details
From: "Whelan, Joseph" <JWhelan1@wm.com> Sort List...

To: Arlene Kabei/R9/USEPA/US@EPA, Steve Armann/R9/USEPA/US@EPA, Rich Vaille/R9/USEPA/US@EPA, Stephen Tyahla/R9/USEPA/US@EPA, Bret Moxley/R9/USEPA/US@EPA, Andrew Helmlinger/R9/USEPA/US@EPA, Steve Wall/R9/USEPA/US@EPA, "'stuart.yamada@doh.hawaii.gov'" <stuart.yamada@doh.hawaii.gov>, "'Steven.chang@doh.hawaii.gov'" <Steven.chang@doh.hawaii.gov>, "'alec.wong@doh.hawaii.gov'" <alec.wong@doh.hawaii.gov>

1 Attachment

WMH Ltr Rpt Sedimentation Basin Repair_061511.pdf

Greetings all.

Please find a copy of the final report documenting the restoration of the sedimentation basin located at the Waimanalo Gulch Sanitary Landfill.

Best regards,

Joe

Joe Whelan

General Manager
Waste Management of Hawaii
808-668-2985, ext. 15 Office
808-668-1366 Fax
808-479-4610 Mobile

Waste Management's landfills provide over 17,000 acres of protected land for wildlife habitats and 15 landfills are certified by the Wildlife Habitat Council.

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

AECOM
1001 Bishop Street, Suite 1600
Honolulu, Hawaii 96813-3698
www.aecom.com

808 523 8874 tel
808 523 8950 fax

June 15, 2011

Waste Management of Hawaii
Waimanalo Gulch Sanitary Landfill
92-460 Farrington Highway
Kapolei, Hawai'i 96707

Attention: Mr. Joe Whelan

Subject: Sedimentation Basin Restoration Observation Report, Waimanalo Gulch Sanitary Landfill, Kapolei, HI

Dear Mr. Whelan:

1.0 INTRODUCTION

This letter report presents observations conducted during the restoration of the storm water sedimentation basin at the Waimanalo Gulch Sanitary Landfill (WGSL) located at 92-460 Farrington Highway in Kapolei, Hawai'i. A series of storm events occurring in late December 2010 through mid-January 2011 resulted in high surface runoff flows at the site, which deposited excessive sediment in the sedimentation basin, thereby reducing its design capacity and functionality.

2.0 RESTORATION ACTIVITIES

The restoration of the sedimentation basin was performed in accordance with the *Work Plan for Sedimentation Basin Restoration* prepared by GEI Consultants (GEI), dated February 21, 2011 (Attachment 1). Restoration activities were conducted by Waste Management of Hawaii (WMH) personnel. AECOM Technical Services (AECOM) performed oversight for the documentation including daily reports (Attachment 2), photo documentation (Attachment 3), and report preparation. Daily reports are included in and a photo log documenting the restoration is included in. A summary of the restoration activities timeline is presented in Table 2-1.

Table 2-1: Restoration Activities Timeline

Task	Start Date	Completion Date
Storm water Removal	4/5/11	6/6/11
Basin Restoration	4/14/11	6/9/11

2.1 STORM WATER REMOVAL

Following authorization by the State of Hawaii Department of Health (DOH), storm water contained within the sedimentation basin was pumped by WMH into a water truck and used onsite to irrigate sideslope vegetation and for dust control on haul roads. A copy of the DOH authorization letter is included in Attachment 4.

During the restoration of the sedimentation basin, several additional storm events deposited additional storm water into the basin, thereby increasing the length of time necessary to restore the basin. Based on a summary of WMH truck logs, approximately 806,500 gallons of storm water was removed from the sedimentation basin during the restoration activities.

2.2 BASIN RESTORATION

Following removal of accumulated storm water within the sedimentation basin, an excavator was used to remove the sediment from the basin. Sediment removed from the basin was transported using dump trucks and stockpiled on the lined areas of the WGSL, primarily within the northern portion of municipal solid waste (MSW) Cell E6. Stockpiled sediment was allowed to dry, prior to re-use as daily cover on the MSW working face. Based on a summary of WMH truck logs, approximately 14,610 cubic yards (yd^3) of sediment was removed from the sedimentation basin during the restoration activities.

During restoration of the basin, as-built conditions and design grades were re-stored, which included an approximate floor elevation of 65-feet (ft) above mean sea level with sideslopes of 2 horizontal to 1 vertical.

The 4-ft high interior berm remained intact and accumulated sediment was removed to expose the rock riprap, no additional restoration of the interior berm was required.

Sediment and rock debris was removed from the grouted rock riprap at the discharge point for the 18-inch and 42-inch storm water pipes into the northeast corner of the sedimentation basin. No damage to the grouted rock riprap at the discharge point was observed.

In addition, no debris or sediment was observed within the 42-inch corrugated metal pipes (CMP) outfalls or the riprap embankment/spillway; therefore, no additional restoration of these areas was required.

Additional restoration activities of the sedimentation basin are discussed in the following sections.

2.3 SUBDRAIN SYSTEM

Following excavation of the sediment in the southern basin area, the subdrain trenches were exposed and the drainage gravel within the infiltration trenches inspected. Due to observed sediment within the drainage gravel around the subdrain pipes, WMH decided to replace the subdrain system and installed new 16-oz/yd^2 filter geotextile, 3/4-inch minus drainage gravel, and perforated high density polyethylene (HDPE) pipe.

While removing the existing subdrain system, two as-built deviations from the design drawings were observed. The first deviation included the use of a 4-inch perforated HDPE pipe rather than the 6-inch noted in the design drawings. The second deviation observed was the connection of the HDPE perforated pipes to the 42-inch CMP discharge pipes. As-built connections for the HDPE perforated pipes included pre-cast openings in the concrete vaults for the riser pipes rather than the sleeve directly into the 42-inch CMP pipes noted in the design drawings. Three openings in the western concrete vault and four openings in the eastern concrete vault were observed, one for each of the seven infiltration

trenches. Orientation and dimensions of the infiltration trenches were generally consistent with the design drawings included in the work plan in Attachment 1.

During the replacement of the subdrain system, as-built conditions were restored including the use of 4-inch HDPE perforated pipe and connecting the pipes to the concrete vaults. A Quikcrete® concrete was used to seal around the HDPE pipe penetrations into the vault openings.

A 3/4-inch minus drainage gravel was used around the HDPE perforated pipe, encapsulated by a 16-oz/yd^2 filter geotextile, as shown in the design drawings included in the work plan in Attachment 1. The drainage gravel used during the restoration was an onsite generated material, similar to gravel used for the drainage layer material in the ongoing MSW cell construction.

Following encapsulation of the HDPE perforated pipes with the drainage gravel and geotextile, additional drainage gravel was used for the 6-inch layer above the encapsulated subdrain system, as shown in the design drawings included in the work plan in Attachment 1.

2.4 RISER PIPES

The trash racks from the top of the vertical concrete riser pipes were removed and the remaining debris was removed. In addition, WMH installed a metal loop picking eye to the top of each trash rack for easier removal of the trash rack in the future to clean out debris.

During replacement of the subdrain pipes, the interior of the concrete riser pipes were inspected through the precast openings at the base of the concrete vault. No debris or sediment was observed inside the concrete riser vaults.

2.5 INLET APRON

Following removal of sediment from the downstream end of the concrete lined drainage channel in the northern basin area, a 16-oz/yd^2 geotextile was installed along the width of the drainage channel into the sedimentation basin for a length of 30-ft. The geotextile was covered with approximately 18-inch to 24-inch rock, as shown in the design drawings included in the work plan in Attachment 1.

2.6 VEGETATED DRAINAGE CORRIDOR

Debris was removed from the vegetated corridor by WMH following the January 2011 storm events. As indicated by WMH, in February 2011, vegetation was cleared at the southern end of the vegetated corridor, upstream of the spillway to the three CMP culvert outfalls beneath Farrington Highway. Following vegetation clearing along the width of the discharge spillway and approximately 20-ft north into the vegetated corridor, a sedimentation fence was installed along the length of the spillway. The sedimentation fence was *S-Fence*™ manufactured by ERTEC Environmental Systems. The area that had been cleared of vegetation during the installation of the sedimentation fence has re-vegetated.

No debris or bare soil was observed within the vegetated drainage corridor following sedimentation basin restoration activities. In addition, no damage, debris or sediment was observed at the 42-inch CMP outfalls into the vegetated drainage corridor.

3.0 CONCLUSIONS

AECOM performed field observations and documentation of the restoration of the sedimentation basin at the WGSL. In summary, based on our observations, AECOM concludes that the work represented by the attached documentation is in conformance with the original construction documents and their design intent, the *Work Plan for Sedimentation Basin Restoration* (GEI 2011), and industry standard construction practices.

If you have any questions or need more information about this project please call me at (808) 356-5321.

Sincerely yours,

Ronald E. Boyle, P.E.
AECOM Technical Services, Inc.

Attachments:

1 Restoration Work Plan
2 Daily Reports
3 Photo Log
4 DOH Storm Water Reuse Authorization

cc: Jesse Frey, Waste Management of Hawaii
Justin Lottig, Waste Management of Hawaii

Attachment 1
Restoration Work Plan

GEI Consultants

180 Grand Ave, Ste 1410
Oakland, California 94612
510-350-2900
FAX 510-350-2901

February 21, 2011
Project Number 070181

Waste Management
Richard T. Von Pein, P. E.
Director of Engineering, Western Group
6640 Amber Lane
Pleasanton, CA 94566

Subject: Work Plan for Sedimentation Basin Restoration- Waimanalo Gulch Sanitary Landfill, Ewa Beach, Oahu, HI

Dear Mr. Von Pein,

As requested, GEI Consultants (GEI) has prepared a work plan to restore the sediment basin system to its intended capacity and function after the occurrence of the recent storm events in December 2010 and January 2011.

Sedimentation Basin Features

The sedimentation basin was originally designed and constructed in the late 1980's. Recently (2006-2007), there were several modifications made to the basin including the placement of an interior pond retention berm, swale energy dissipation improvements, installation of a subdrain system, and replacement of the two 42-inch corrugated metal riser pipes with concrete risers. Attachment A includes a copy of the design drawings by Shimabukuro, Endo, and Yoshizaki, Inc. showing the original basin design, and EarthTech drawings showing the recent modifications. Attachment B includes photographs of the basin in October 2007 after construction of the basin modifications.

The sedimentation basin currently receives drainage that is collected in the western concrete-lined drainage channel immediately upstream of the basin. The sedimentation basin consists of the following elements, described in an upstream to downstream direction:

- **Sedimentation Basin Inlet Apron -** The inlet located at the downstream end of the western concrete lined drainage channel consists of a 30-foot long rock riprap apron. The rock riprap sizes are approximately 18 to 24 inches in diameter.

- **Northern Basin and Interior Berm Area –** A riprapped interior berm is located in the northern (upstream) portion of the basin. The interior berm is approximately 4 feet high. The northern basin area and interior berm function as a pre-holding area to reduce the amount of coarser sediment that will continue to travel downstream in the basin, and possibly reduce the hydraulic mixing and churning of the finer sediment in the southern basin. The approximate elevation of the basin floor in this area is El. 65. The basin side slopes adjacent to the floor are inclined at 2 horizontal to 1 vertical (H: V), and the total depth of the basin in this area is approximately 18 feet. There is also a riprapped energy dissipator at the northeast corner of the basin to reduce exit velocities from 18-inch and 42-inch storm water pipes exiting into the basin at this location.

- **Southern Basin Area** - The southern portion of the basin contains a subdrain system beneath the basin floor to lower and discharge the standing water in the basin during low flow events. The subdrain system and consists of 6-inch, perforated high density polyethylene (HPDE) pipes placed in an 18-inch wide by 24-inch deep infiltration trench wrapped in a filter cloth. The trench is backfilled with ½ to ¾-inch drain rock with an overlying 6-inch sand bedding layer at the base of the sedimentation basin. The HDPE pipes are connected directly to the CMP outlet pipes (described below) to allow for conveyance of drainage from the subdrain system.

  The basin side slopes adjacent to the floor are inclined at 2 horizontal to 1 vertical, and the total depth of the basin in this area is approximately 18 feet. However, the earthen embankment at the downstream end of the pond is approximately 4.5 to 5 feet lower, to form an emergency spillway crest for the sedimentation basin (see riprapped embankment and spillway description below).

- **Outlet Riser Pipes** - There are two reinforced 48-inch diameter concrete inlet riser pipes that function as principal outlets for the sedimentation basin. The riser pipes were constructed without intermediate orifice openings, so drainage of basin inflow will be through the overflow outlet at the top of the riser or through the underlying subdrain system described previously. The vertical riser pipes outlets connect via a concrete box to 42-inch diameter horizontal corrugated metal pipes (CMP's) located at the base of the embankment at the downstream end of the sedimentation basin. The CMP's outlet on the spillway apron at the downstream toe of the embankment.

- **Riprapped Embankment and Spillway** - An earthfill embankment was constructed at the south end of the basin to provide containment on the downstream side of the pond. The embankment is armored with a 2' thick layer of grouted riprap. The crest and downstream slope of the embankment functions as an emergency spillway apron to discharge storm water downstream from the basin. The embankment was constructed with 2 H to 1 V sideslopes and a crest width of approximately 19 feet. The inboard sideslope of the embankment is

approximately 14 feet high. The outboard side of the embankment is approximately 21 feet high.

- **Vegetated Drainage Corridor** - A vegetated area is located downstream of the spillway apron and the 42-inch CMP pipe outlets. The vegetated area is approximately 200 feet long by 50 to 100 feet wide and conveys storm water flows downstream to three CMP culvert outfalls beneath Farrington Highway.

Work Plan Activities

In order to restore the basin to its intended capacity and function, specific activities will be performed for the features described previously. These activities are described in more detail and are currently being implemented or will be implemented as soon as possible after the basin is dewatered.

- **Basin Pumping** - Prior to cleaning and inspection of the sedimentation basin features, all standing water will be pumped from the basin and discharged at a POTW designated by the City and County of Honolulu.

- **Basin Inlet Apron** - All sediment and debris on top of the energy dissipator and interior berm will be removed until the underlying riprap apron and berm armoring are exposed. Any riprap missing from this area will be replaced with 18-inch to 24-inch diameter rock. The riprap will consist of basalt material with good rock quality obtained from the on-site excavation activities within the landfill.

- **Northern Basin and Interior Berm Area** - The sediment and debris from the basin will be removed to restore the basin floor to the design elevation of El.65.0. Any sediment that collected against the toe or side slopes of the basin will be removed to restore the basin slopes to their design 2 H to 1V inclination and the basin floor width to the design dimensions shown in Attachment A. The riprap armoring on the interior berm and energy dissipation swales will be fully uncovered and inspected to determine if there are areas of dislodged or missing riprap. Any areas of missing riprap will be replaced. The riprap will consist of on-site material as described previously. After drying, sediment will be used for daily cover and debris will be disposed in the landfill.

- **Southern Basin Area** - The sediment and debris from the basin will be removed to restore the basin floor to the design elevation of El.65.0. Any sediment that collected against the toe or side slopes of the basin will be removed to restore the basin slopes to their design 2 H to 1V inclination and the basin floor width to the dimensions shown in Attachment A. After removing sediment from the basin floor the subdrain trenches will be located and the 6” washed sand layer on the basin floor covering the subdrain system should be replaced. The concrete inlet riser pipes and steel trash racks will be visually inspected for debris or sediment blockage. If blockages are observed, they will be removed from the risers and

trash racks. The 42-inch CMP outfall beneath the embankment will be visually inspected for debris or sediment blockage. All sediment and debris should be removed from the CMP outfall pipes. After drying, sediment will be used for daily cover and debris will be disposed in the landfill

- **Riprapped Embankment and Spillway** - As a result of the December 2010-January 2011 storm events, sediment may have accumulated against the grouted riprap on the inboard and outboard faces of the embankment and spillway area. Any accumulated sediment in these areas will be removed and disposed properly in the landfill. Disposal may include using the material for daily cover. The overflow spillway will also be visually inspected for signs of debris that is blocking the overflow weir or that has migrated on the downstream face of the weir. All debris in the spillway will be collected and deposited in the landfill.

- **Vegetated Drainage Corridor** - The area immediately downstream of 42-inch CMP pipe outfalls and riprap apron was protected in the past with rock riprap. The riprap was placed to allow for storm water discharge to dissipate and spread throughout the vegetated area before leaving the site. These riprap areas will be inspected, and any missing or dislodged riprap will be replaced. On-site rock material will be used as described previously. All debris that migrated into the drainage corridor will be removed and disposed in the landfill.

  There may be bare soils areas within the vegetated drainage corridor that require short term erosion protection measures. These areas will be protected by seeding with erosion resistant vegetation and placement of temporary erosion control matting where necessary. We note that surface soils in the vegetated drainage corridor will be disturbed in order to construct the stilling basin outlet for the Western Surface Water Drainage System. Longer term erosion control measures for the vegetated drainage corridor will be considered during construction of the stilling basin structure.

- **Sediment and Debris Disposal** - All sediment and debris removed from the areas described previously should be disposed in the landfill. Sediment will be stockpiled and allowed to dry. The dried sediment material can then be utilized as daily and intermediate cover during landfilling operations.

- **Implementation of Work Plan** - Waste Management will implement the work plan described using available site personnel and contractors. Inspection will be performed by AECOM engineers as required.

- **Documentation of Work Plan Activities** - Photo-documentation and field reports will be prepared by landfill personnel during and after restoration activities to support final reporting efforts of work plan implementation to the USEPA.

Schedule – Liquids are scheduled to be removed from the pond by February 14th provided there is no additional rainfall. After liquids are removed removing sediment, debris and silted-in underdrain material will occur. As soon as all material is removed from the pond, the underdrain will be reconstructed, other necessary repairs made and the pond put back into service. We anticipate removing the sediment and debris, and reconstructing the pond will take approximately 4 weeks and should be completed by March 14, provided we do not receive significant additional rainfall. If storm water enters the basin prior to the removal of the sediments, we would not discharge it as storm water, except in an emergency and only after consultation with the Hawaii Department of Health and the USEPA. The water will be removed and transported to a POTW designated by the City and County of Honolulu.

Very truly yours,
GEI Consultants, Inc.

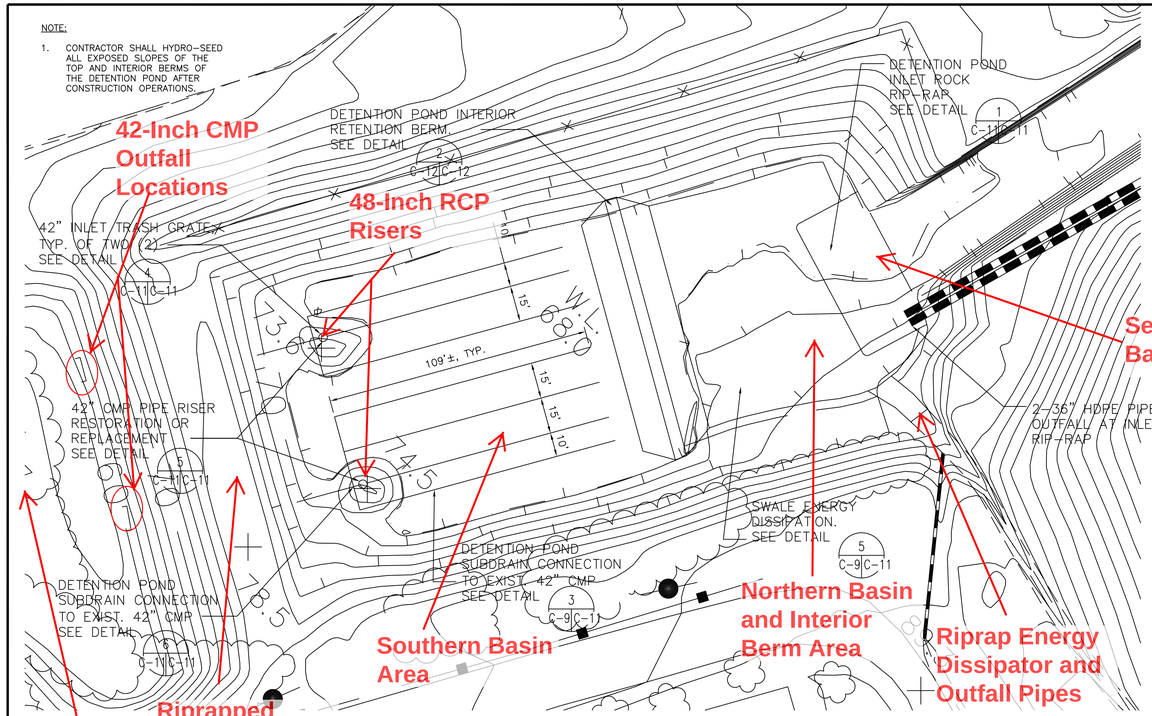
William A. Rettberg, P.E.
Vice President

Attachment A: Drawings by Shimabukuro, Endo, &Yoshizaki, Inc. and Earth Tech Depicting Basin Configuration and Features

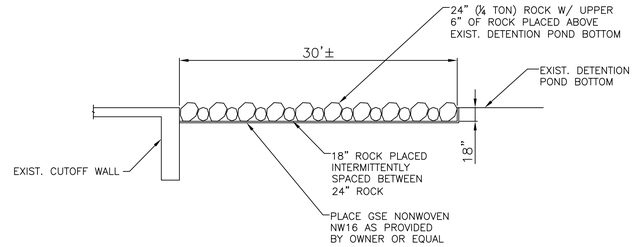
Attachment B: Photographs of the Sedimentation Basin Area in October 2007 After Construction of Modifications

ATTACHMENT A

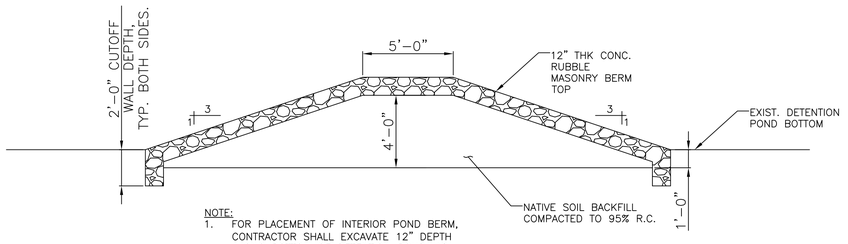
Drawings by Shimabukuro, Endo & Yoshizaki, Inc. and EarthTech Depicting Basin Configuration and Features



A C-12 DETENTION POND LAYOUT
SCALE: 1" – 30'

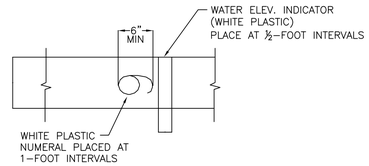


1 C-11 DETENTION POND INLET RIP-RAP
NO SCALE



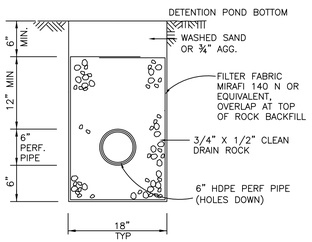
NOTE:
1. FOR PLACEMENT OF INTERIOR POND BERM, CONTRACTOR SHALL EXCAVATE 12" DEPTH ALONG BOTTOM OF DETENTION POND, AS SHOWN ABOVE, AND TO LIMITS OF THE INTERIOR POND BERM ACCORDINGLY.

2 C-11 DETENTION POND BERM
NO SCALE



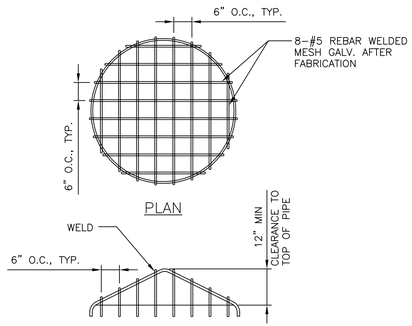
NOTE: ATTACH NUMERAL AND INDICATOR TO CONCRETE WITH ADHESIVE OR SS STRAPS.

7 C-11 NUMBER DETAIL
NO SCALE

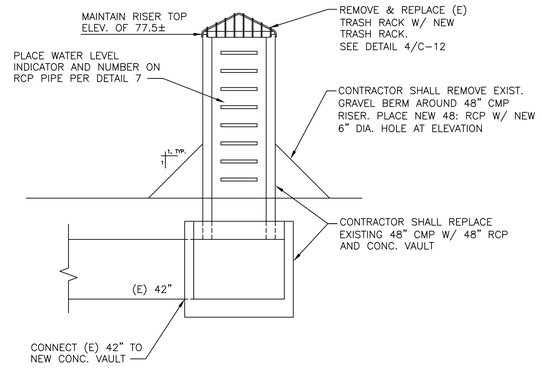


NOTE:
1. SUBDRAIN PIPES SHALL MAINTAIN A 0.5% SLOPE (MIN.) TOWARDS 42" CMP CONNECTION.

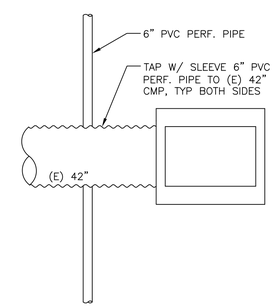
3 C-11 DETENTION POND SUBDRAIN DETAIL
NO SCALE



4 C-11 RISER GRATE
NO SCALE



5 C-11 REPLACEMENT OF (E) 42" RISER DETAIL
NO SCALE



6 C-11 6" SUBDRAIN TO 42" CMP CONNECTION DETAIL
NO SCALE

FINAL CONSTRUCTION PLANS

REV	DATE	BRIEF	BY	APPROVED

JOB NUMBER 92382
FILE NO. 92382-C-11
DESIGNED: BWR DRAWN: RKH
CHECKED: REB APPROVED: – –
SCALE: NO SCALE

BENJAMIN W. REALICA LICENSED PROFESSIONAL ENGINEER No. 11337-C HAWAII, U.S.A.

This work was prepared by me or under my supervision. ("Supervision of design" shall be as defined in Chapter 115, Hawaii Administrative Rules, Professional Engineers, Architects, Surveyors, and Landscape Architects, State of Hawaii, Subchapter 1 Section 16-115-2. Definitions effective June 30, 1994)

WASTE MANAGEMENT

PHASE 1 INTERIM ON-SITE DRAINAGE MEASURES PLANS

DETENTION POND DETAILS

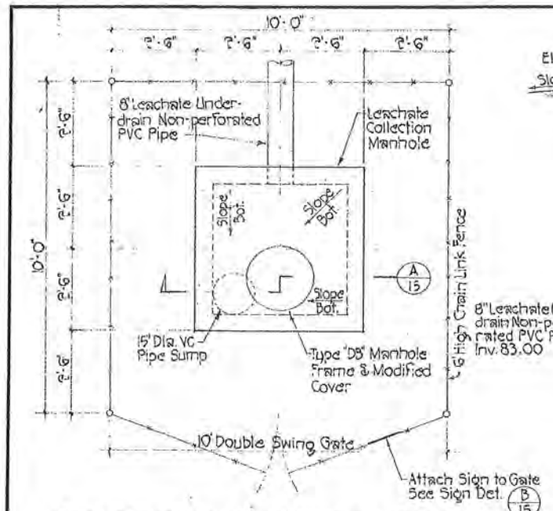
DATE: 08/01/06
DRAWING NO. C-11
SHEET 14 OF 14

Riprapped Embankment and Spillway

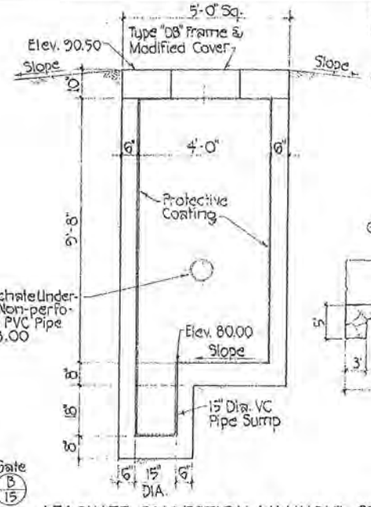
Original CMP Riser Pipe Replaced with Concrete Riser (See EarthTech Drawing C-11)

42-inch CMP Outlet

Typical Section Across Sedimentation Basin

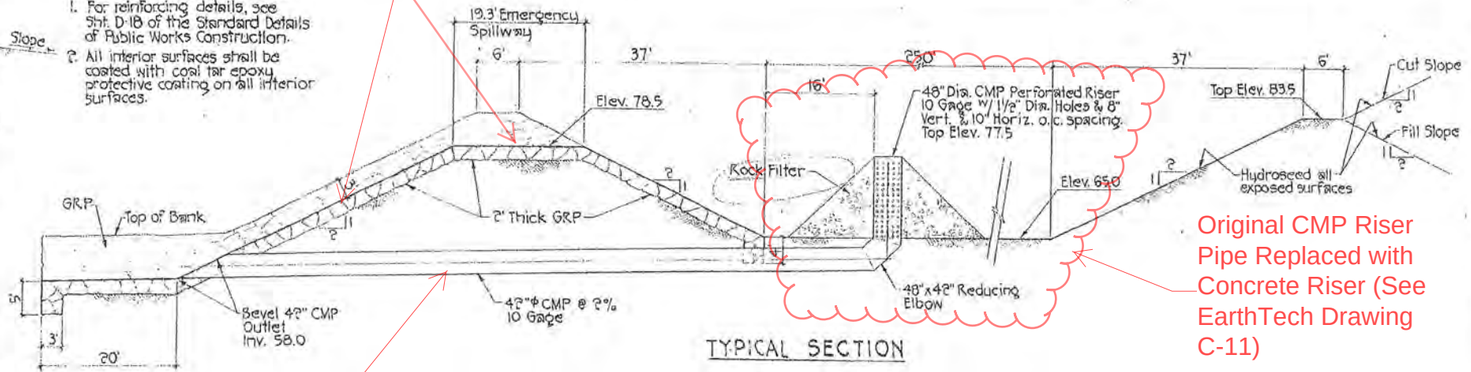


LEACHATE COLLECTION MANHOLE SITE PLAN
Scale: 1/8" = 1'-0"

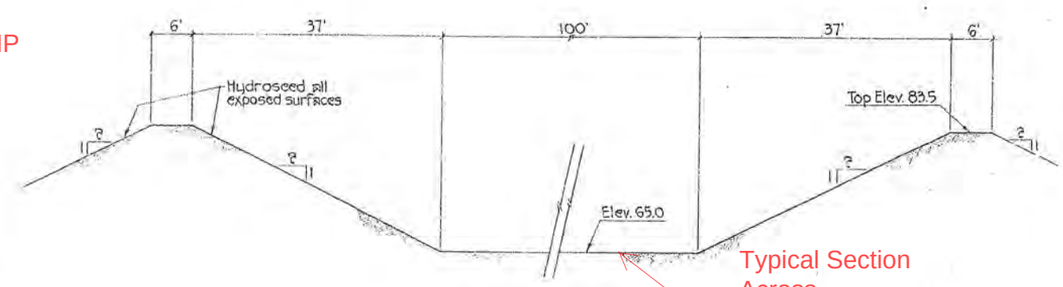


LEACHATE COLLECTION MANHOLE - SECTION A 15
(STANDARD C&C SHALLOW DRAIN MANHOLE FOR PAVEMENT AREA W/ MODIFIED BOTTOM SLAB) Scale: 1/2" = 1'-0"

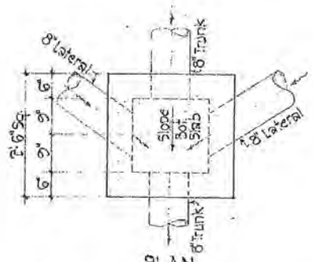
NOTES FOR LEACHATE MH & JB:
1. For reinforcing details, see Sht. D-18 of the Standard Details of Public Works Construction.
2. All interior surfaces shall be coated with coal tar epoxy protective coating on all interior surfaces.

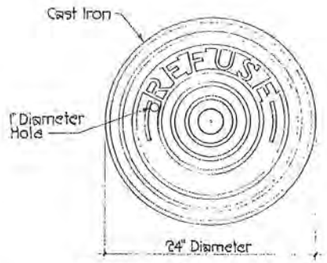


TYPICAL SECTION



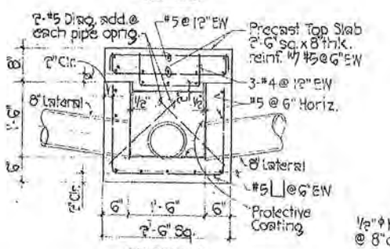
TYPICAL SECTION



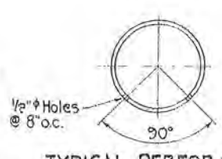


PLAN - DETAIL MODIFIED COVER
Scale: 1½" = 1'-0"

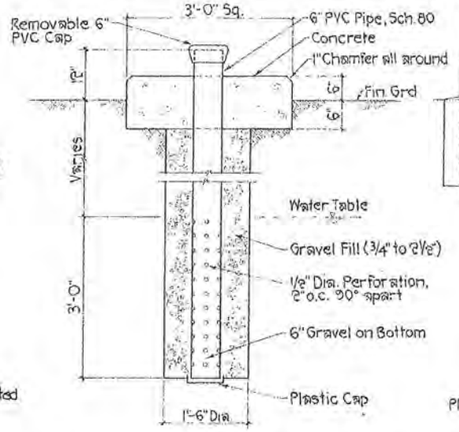
NOTES:
1. All castings shall be made accurately to the dimensions shown. Seat and cover shall be machined, not ground to secure flat and true surfaces. The cover shall not rattle in any position.
2. For details of the manhole cover, see Sht. D-30 of the Standard Details for Public Works Construction.



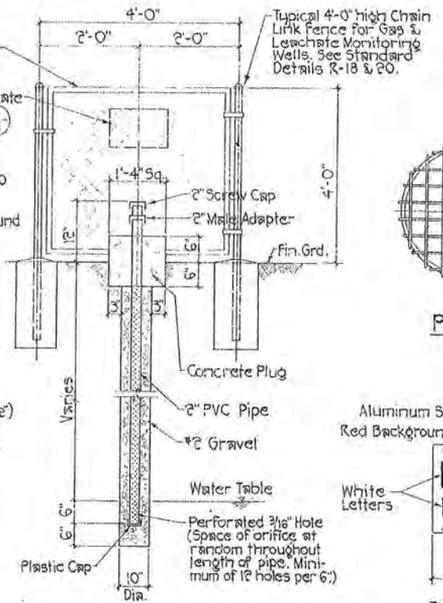
LEACHATE JUNCTION BOX DETAIL
Scale: 3/4" = 1'-0"



TYPICAL PERFORATED PVC PIPE Not to Scale

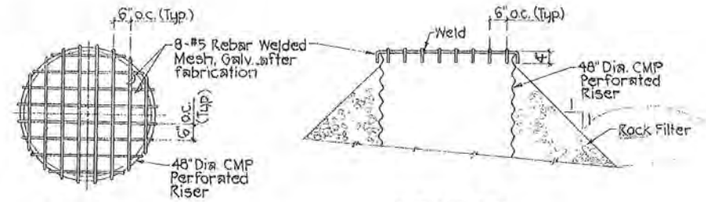


LEACHATE MONITORING WELL DETAIL
Not to Scale



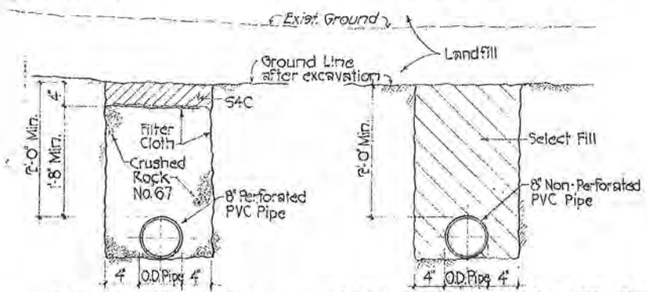
GAS MONITORING WELL DETAIL
Not to Scale

SILTING BASIN
Scale: 1" = 10'



RISER GRATE
Scale: 1½" = 1'-0"

SIGN DETAIL B 15
Not to Scale



TRUNK & LATERAL LINE
TRUNK LINE (@ STA. 1+00 TO STA. 2+00)
LEACHATE UNDERDRAIN - TYPICAL TRENCH DETAILS Not to Scale

APPROVED:

CHIEF, DIVISION OF ENGINEERING (FOR GRADING ONLY) — DATE 11/20/87

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STANLEY S. SHIMABUKURO, REGISTERED PROFESSIONAL ENGINEER, No. 1322-C, HAWAII, U.S.A.

NO.	DATE	DESCRIPTION	ENGR.	DEPT. ORD'R
		REVISIONS		APPR'D

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
DIVISION OF REFUSE COLLECTION AND DISPOSAL
WAIMANALO GULCH SANITARY LANDFILL

MISCELLANEOUS DETAILS

ENGINEER HIY — DATE OCTOBER 2, 1986
DRAFTSMAN WMI, RYY — CHECKED BY SSS
APPROVED
CHIEF, DIVISION OF REFUSE COLLECTION AND DISPOSAL

SHIMABUKURO, ENDO & YOSHIZAKI, INC.
CIVIL & STRUCTURAL ENGINEERS

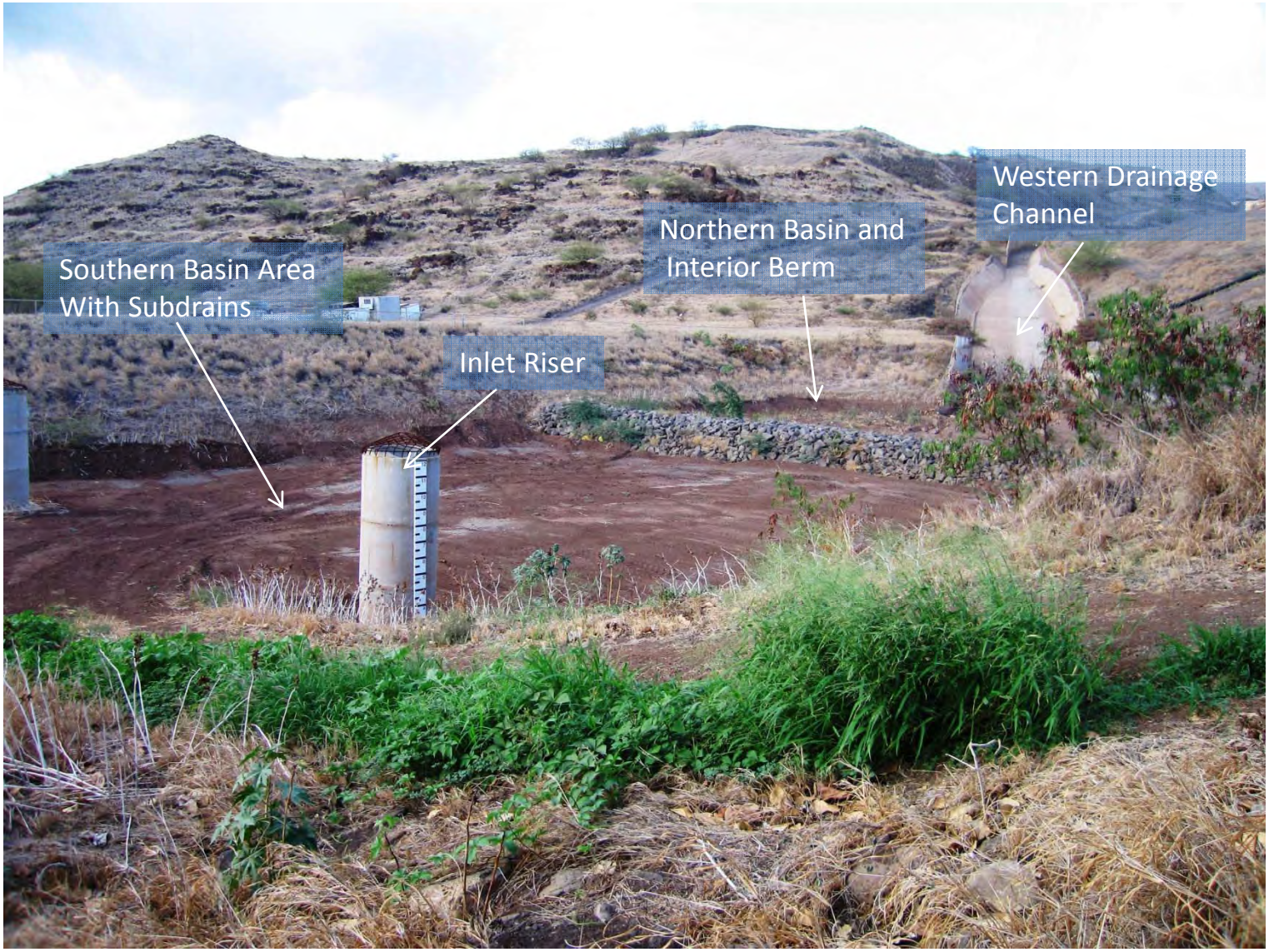
F.B.
JOB NO.

FILE | POCKET | FOLDER | AD

ATTACHMENT B

Photographs of Sedimentation Basin Area in October 2007 After Construction of Modifications

View of Basin Looking South Along the Western Concrete-Lined Drainage Channel



View of Sedimentation Basin Looking North

View along Riprapped Embankment Crest Looking West

View of Basin Looking Northeast from Riprapped Embankment Crest

Attachment 2
Daily Reports

Daily Field Report Summary

Waimanalo Gulch Sanitary Landfill
Waste Management of Hawaii
Project No. 60191059.02.07

Date	Daily Report Notation
4/14/11	Following receiving approval from DOH to re-use the storm water on site for dust control and to irrigate sideslope vegetation, WMH has since completed pumping water contained within the sedimentation basin by pumping to water truck for onsite use. WMH begins removing sediment from sedimentation pond per Work Plan prepared by GBI (dated February 21, 2011). Sediment being placed in dump truck and stockpiled on lined portions of the site to dry and then to be used as daily cover.
4/15/11	WMH continues excavating sediment from the northern portion of the sedimentation basin.
4/26/11	Following additional rainfall, excavated portion in northern portion of the basin has been pumped of stormwater and WMH continues excavating sediment from sedimentation pond.
4/28/11	WMH continues excavating sediment from northern portion of the sedimentation basin.
5/2/11	WMH continues excavation of sediment from northern portion of the sedimentation basin. Northern portion of basin ~90% excavated of sediment. Rain storm at site in afternoon places additional stormwater into northern portion of basin.
5/3/11	WMH excavating sediment from southern portion the sedimentation basin. Northern portion where sediment had recently been removed has filled with water due to rain event.
5/4/11	WMH pumping storm water from northern portion of sedimentation basin into water truck for onsite use. Excavating sediment from southern portion.
5/5/11	WMH continues excavating sediment southern portion of the sedimentation basin, focusing on excavation from this area while pumping of storm water from northern portion.
5/6/11	WMH continues excavating sediment from sedimentation basin, southern portion. Pumping storm water from northern portion into water truck also continues.
5/10/11	Large rain storm yesterday has filled sediment excavations the northern and southern portions of the sedimentation basin with storm water. Storm water is up to the top of the interior berm across both portions. WMH pumping storm water from northern portion into water truck.
5/11/11	WMH pumping storm water from southern portion of sedimentation basin into water truck.
5/12/11	WMH continues pumping storm water from southern portion of sedimentation basin into water truck.
5/16/11	Following removal of accumulated stormwater in the southern portion of the basin, WMH continues excavating sediment. Northern section is ~1/2 full of storm water.
5/17/11	WMH continues excavating sediment from southern portion of sedimentation basin; northern section still is ~1/2 full of water.
5/18/11	WMH continues excavating sediment from southern portion of sedimentation basin.
5/19/11	WMH continues to excavate sediment from southern portion of sedimentation basin and pumping water from northern portion into water truck.
5/20/11	WMH continues excavating sediment from southern portion of sedimentation basin. ~2/3 of sediment removed from southern portion. Northern portion is ~1/2 full with storm water. WMH pumping water from northern portion into water truck.
5/23/11	WMH continues removing sediment and water from sedimentation basin. Southern portion is ~95% complete with sediment removal. Northern portion is ~1/3 full with storm water.
5/24/11	WMH continues pumping water from northern portion of sedimentation pond into water truck.

Date	Daily Report Notation
	Excavator working in southern portion to expose the subdrain trenches. Found one of the subdrains connecting into concrete box. Following inspection of the drainage gravel within the encapsulated subdrain, excessive sediment was observed with the gravel and WMH decides to locate all seven subdrain trenches and replace 4-inch perforated HDPE pipe, geotextile and drain rock with new material. Note that a 4-inch perforated pipe was installed rather than the 6-inch perforated HDPE pipe noted in the design drawings.
5/25/11	WMH has exposed and removed the three of the subdrain pipes, geotextile, and drainage gravel for the three western drain trenches that connect to the western inlet structure. Begin removing the four drains on the eastern side. Note that the subdrain pipes are connected to pre-cast openings in the concrete vaults, rather than sleeved into the 42-inch CMP discharge pipes as shown in the design drawings.
5/26/11	WMH places 16-oz/yd^2 geotextile in the three western subdrain trenches. two of four of the eastern drain trenches have been exposed and existing subdrain material removed. Continue pumping water from the northern portion of the sedimentation basin. WMH begins placing 3B-fine drainage rock in 6-inch layer over geotextile in subdrain trenches, as shown on the design drawings.
5/27/11	WMH continues working on sedimentation pond. Pumping water from northern portion into water truck. Six of seven subdrain trenches have been exposed and new geotextile and 6-inch of drainage gravel placed. Plan to get 6-inch HDPE pipe today. Per WMH, not replacing the 4-inch pipe that was previously installed, going with 6-inch per design. Inspect concrete riser vaults through the pre-cast openings for the drainage pipes. No sediment or debris observed in vaults or 42-inch CMP discharge pipes, can see daylight at end of discharge pipes.
5/28/11	Six of the seven subdrain pipes have been replaced with new 4-inch perforated HDPE (had planned to use 6-inch; however, none was available on-island). Pipe placed on 6-inch of drainage gravel, covered with a minimum of 12-inch on sides/top and wrapped with geotextile as shown in the design drawings. Northern ends of subdrain pipes wrapped with geotextile, southern ends of seven subdrain pipes have been cemented to the concrete vaults with Quickcrete®. Last drain line in center of basin to be replaced following backfill of other trenches to allow access.
5/31/11	WMH has completed replacement and backfill of six drain line trenches. The last subdrain pipe (center of basin) is replaced. Backfill over geotextile with a minimum of 6-inch of drainage gravel. Floor of southern section backfilled with ~2-ftof drainage gravel over subdrain trenches and rock backfill in between trenches to restore 65-ft design elevation of floor.
6/1/11	WMH has completed repairs to the southern portion including replacing subdrains and backfill to 65-ft elevation. Excavator working on removing sediment from northern portion and the downstream end of the concrete drainage channel.
6/2/11	Repairs to southern portion of the sedimentation basin, including subdrain replacement and re-establishment of 65-ft floor elevation complete. WMH excavating sediment from northern portion.
6/3/11	Work on sedimentation basin stopped for the day due to rain storm. Water ponding in northern portion of basin.
6/4/11	WMH pumping storm water from northern portion of sedimentation basin into water truck following yesterday's rain.
6/6/11	WMH continues pumping stormwater into water truck and removing sediment from northern portion of sedimentation basin.
6/7/11	WMH completed pumping storm water from northern portion of the sedimentation basin into water truck. Removing sediment from the inlet apron along the north edge of the basin.

Date	Daily Report Notation
6/8/11	WMH continues removing sediment from northern portion of the sedimentation basin. Following removal of sediment from the downstream end of the concrete lined drainage channel in the northern portion, a 16-oz/yd2 geotextile was installed along the width of the drainage channel into the sedimentation basin a length of 30-ft. The geotextile was covered with ~18-inch to 24-inch rock, as shown in the design drawings. Conducted walk around sedimentation basin and vegetated corridor with Justin Lottig from WMH. No damage/debris/sediment observed on the spillway, CMP discharge pipes, or the vegetated corridor. At the site discharge point at the spillway upstream of the culvert outfalls under Farringdon Highway, inspect the portion that had been cleared of vegetation following the January 2011 storm events (work conducted in February 2011). Justin indicated that the portion along the spillway, north ~20ft into the corridor was cleared of vegetation/debris and a sediment fence installed along the length of the spillway. Area has re-vegetated with grass and no bare soil was observed. The sediment fence (~12" high above ground and 2" below ground) was secured in place with metal stakes upstream of spillway before the culver outfalls.
6/9/11	Replacement of the ~18" – 24" rock at in inlet apron is completed. All sediment in the concrete drainage channel upstream of the basin, including the concrete energy dissipaters have been cleared of sediment. WMH clears sediment and loose rocks from the outfalls of the 18-inch and 42-inch storm water pipes in the northeast corner of the basin, plan to extend rock riprap through the access ramp into the northern portion. WMH removed the trash rack from the top of the concrete riser pipes to clean debris and weld a picking hook for easier removal to clean.

Prepared By:

Dan Frerich
AECOM

Name Signature

Attachment 3
Photo Log

Photo 1: Sedimentation basin following December 2010 storm events, looking north.

Photo 2: Sedimentation basin following January 2011 storm event, looking north.

Photo 3: Sedimentation basin prior to pumping by WMH in February 2011, looking north.

Photo 4: Sedimentation basin in April 2011 while pumping by WMH, looking southwest.

Photo 5: Beginning excavation of sediment within the northern portion of the sedimentation basin, looking north.

Photo 6: Excavation of sediment in northern portion of the sedimentation basin, looking southwest.

Photo 7: Sedimentation basin following additional rain which filled the excavation in the northern portion with storm water, looking south.

Photo 8: Continuing excavation of sediment in the northern portion following pumping of storm water, looking west (excavator sitting on interior berm).

Photo 9: Northern portion of the sedimentation basin following removal of ~2/3 of accumulated sediment, looking southwest.

Photo 10: Northern portion of the sedimentation basin following additional rain which filled the excavation in the northern portion with storm water, looking southwest.

Photo 11: Overview of the sedimentation basin following a rain event in May 2011 which placed additional storm water in both the northern and southern portions of the basin.

Photo 12: Sedimentation basin following pumping of storm water in the southern portion, looking south.

Photo 13: Excavating sediment around the concrete riser in the southern portion of the sedimentation basin, looking east.

Photo 14: Southern potion of sedimentation basin following removal of sediment from basin floor and sideslopes, looking west.

Photo 15: Excavating the infiltration trenches of the subdrain system in the southern portion of the sedimentation basin, looking southeast towards the eastern inlet riser.

Photo 16: 16-oz/yd^2 geotextile deployed in the infiltration trenches of the subdrain system in the southern portion of the sedimentation basin, looking south towards the western inlet riser.

Photo 17: 4-inch perforated HDPE subdrain pipes placed over 6-inch thick layer of drainage gravel and16-oz/yd^2 geotextile filter fabric in infiltration trenches, looking southeast.

Photo 18: Placing drainage gravel over the subdrain pipes on the eastern side of the sedimentation basin, looking northeast.

Photo 19: Subdrain pipes connecting into the western concrete riser pipe, looking south.

Photo 20: Concrete seal around the connection of the subdrain pipes to the riser vault.

Photo 21: Geotextile wrap around the upstream end of the subdrain pipe, looking south.

Photo 22: Placing drainage gravel over the subdrain pipes prior to encapsulating with the16-oz/yd^2 geotextile filter fabric on the eastern side of the sedimentation basin, looking northeast.

Photo 23: Excavating sediment from the inlet apron area of the northern portion of the sedimentation basin, looking north.

Photo 24: Pumping water from the northern portion of the sedimentation basin following additional storm water at the site on June 3, 2011, looking southwest.

Photo 25: Excavator placing 18-inch to 24-inch rock over the 16-oz/yd^2 geotextile along the inlet apron of the northern portion of the sedimentation basin, loader removing sediment from concrete energy dissipaters in concrete lined channel, looking northwest.

Photo 26: Inlet apron following restoration on the northern portion of the sedimentation basin at the end of the concrete lined drainage channel, looking north.

Photo 27: Overview of the riprap embankment and the 42-inch CMP's discharge areas into the vegetated corridor, looking southeast.

Photo 28: Rock riprap at the discharge of the 18-inch and 42-inch storm water pipes at the northeast corner of the sedimentation basin

Photo 29: Overview of the spillway at the southern edge of the vegetated corridor, looking east.

Photo 30: Sedimentation fence installed along the spillway at the southern edge of the vegetated corridor.

Photo 31: Overview of the sedimentation basin following restoration, looking south.

Photo 32: Overview of the southern portion of the sedimentation basin following restoration, looking east.

Attachment 4
DOH Storm Water Reuse Authorization

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
INTERIM DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

March 23, 2011

S03268LI

Mr. Joseph Whelan, District Manager
Waste Management of Hawaii, Inc.
92-460 Farrington Highway
Kapolei, Hawaii 96707

Mr. Timothy Steinberger, Director
Department of Environmental Services
City and County of Honolulu
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

Dear Messrs. Whelan and Steinberger:

SUBJECT: Existing Sedimentation Basin
Waimanalo Gulch Sanitary Landfill

On March 3, 2011, the Department of Health (DOH), Environmental Management Division (EMD) received Waste Management of Hawaii, Inc.'s (WMH's) letter dated February 28, 2011 requesting DOH's concurrence to pump water from the sedimentation basin to the permitted discharge point under the City and County of Honolulu's (City's) NPDES Notice of General Permit Coverage (NGPC). The letter further asks whether there is a legal prohibition to the proposed discharge.

The DOH does not concur with the proposed pumping and direct discharge of water from the sedimentation basin to state waters. The proposed discharge would be in violation of the City's Waimanalo Gulch Sanitary Landfill NGPC, and a violation of Hawaii Revised Statutes §342d-50(a). Violations of Hawaii Water Pollution rules and regulations may be subject to administrative, civil, and/or criminal penalties.

However, we recognize that the situation has changed with the western drainage system now functional, the pumping and hauling out of a large portion of the contaminated stormwater, and analytical data for the water and sediment recently taken from the sedimentation basin. It is also evident that additional measures are needed to expedite the rehabilitation of the sedimentation basin. We understand that after the February and March 2011 rain events, the water level in the sedimentation basin rose, prohibiting immediate excavation of the sediments at the bottom of the basin. Therefore, we offer the following options for your consideration. The options do not preclude, and can be performed in conjunction with, the continued pumping of water to the wastewater treatment plant.

1. Utilize the collected water for on-site dust control. Similarly, the water could also be used to irrigate vegetation planted to control erosion on the landfill face. We understand

that WMH has already removed much of the contaminated stormwater (generated from the December 2010/January 2011 storm events) from the sedimentation basin (all of the northern sedimentation cell, and most of the water in the southern sedimentation cell) and transported that water to the wastewater treatment plant. We also understand that analytical data of water collected from the sedimentation basin on February 2, 2011 met concentrations listed in the NGPC; and that analytical data of sediment collected from the northern cell of the sedimentation basin on January 28, 2011 met direct exposure action levels for industrial use. The western drainage system has been functional prior to the February 22, 2011 storm event and no stormwater from Cell E-5 or Cell E-6 has contributed to the sedimentation basin during those events.

Based on the analytical data as well as the limited potential for the introduction of new leachate in the basin, the collected water may be beneficially used as dust control. This approval does not allow copious amounts of liquid to be introduced onto the landfill (i.e., the application(s) cannot generate any runoff). Please be aware that this approval is limited to the current rehabilitation effort and the associated removal of water to provide access to the base of the sedimentation basin. This approval shall no longer be considered valid in the event that leachate may be reintroduced into the sedimentation basin.

2. Revise the Stormwater Pollution Control Plan for the site, under NGPC File No. HIR50A533, Condition No. 5. We understand from your meeting with the Solid and Hazardous Waste Branch on March 3, 2011 that WMH and the City are considering redesigning the treatment and/or discharge elements of the existing sedimentation basin. If some of these elements can be incorporated now to expedite basin rehabilitation, the Clean Water Branch would be open to reviewing these new design elements.

In addition, as requested, the sediments from the northern cell of the sedimentation basin may be used as daily cover in accordance with your solid waste management permit. Please ensure that the sediments comply with the paint filter test requirement prior to use.

Should there be any questions regarding this letter, please contact me at (808) 586-4304.

Sincerely,

STUART YAMADA, P.E., CHIEF
Environmental Management Division

c: DOH, Clean Water Branch
DOH, Solid and Hazardous Waste Branch
Stephen F. Tyahla, EPA Region IX
Edward Bohlen, Deputy Attorney General
Kathy Ho, Deputy Attorney General